

# (12) UK Patent Application

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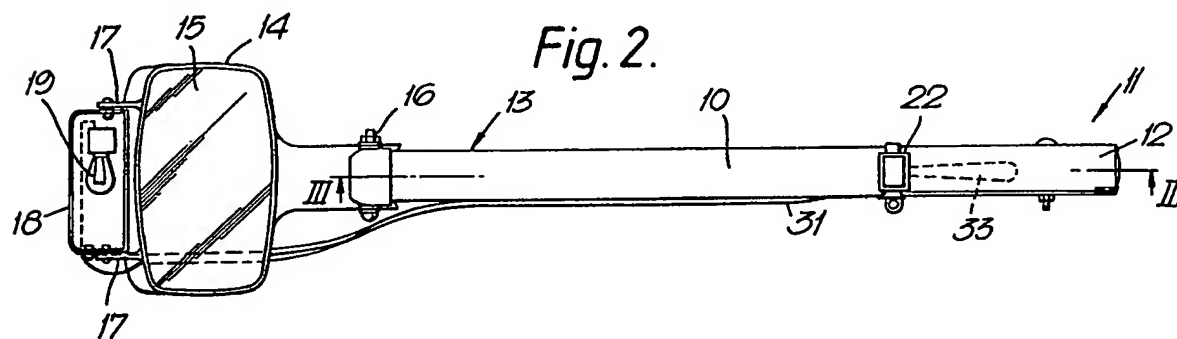
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## (54) Inspection device

(57) An inspection device includes a rod (10) having a grip (12) at one end (11) and a mirror (15) and lamp (19) at the other end (13). The lamp (19) is associated with a beam focusing assembly (18) whose orientation can be adjusted under the control of actuating means (33) situated at the first end (11) of the rod (10).



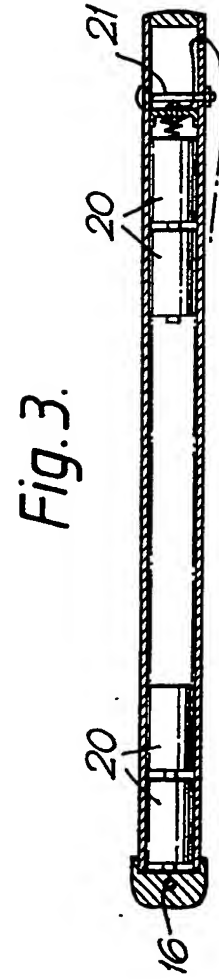
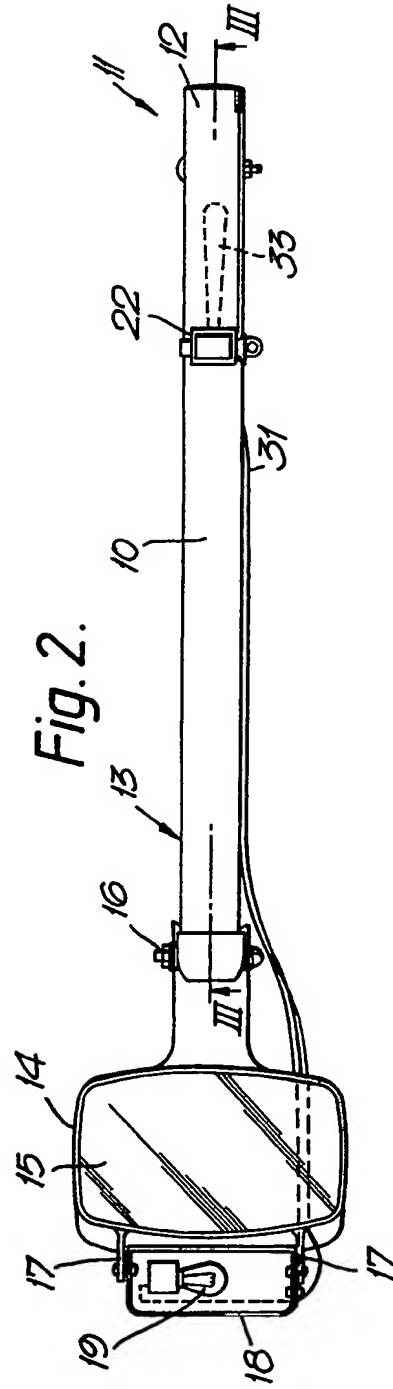
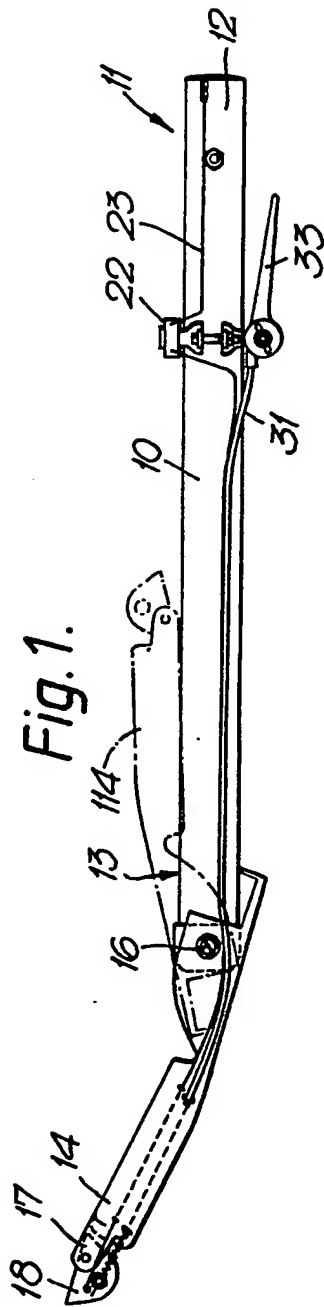


Fig. 4.

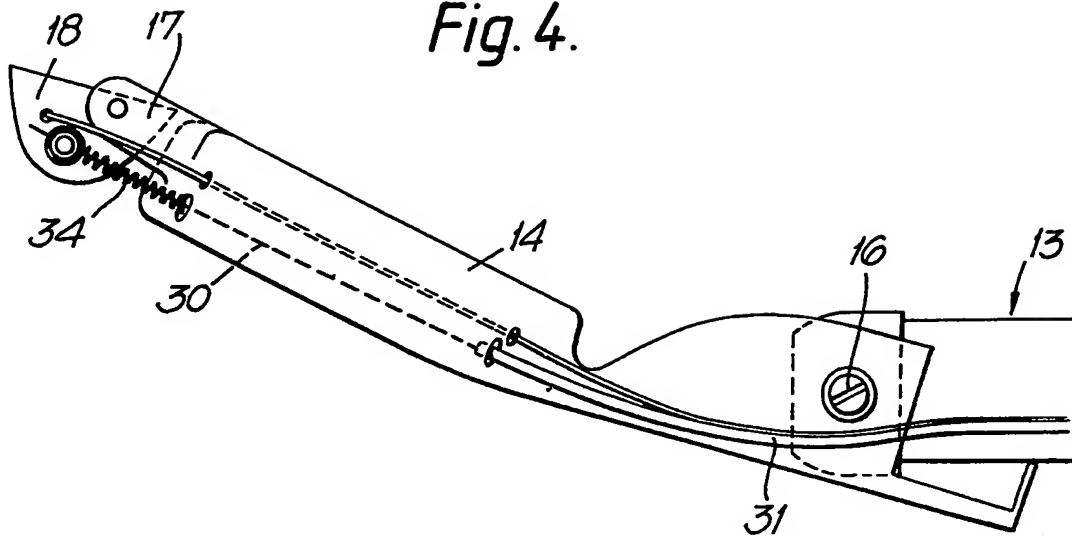


Fig. 5.

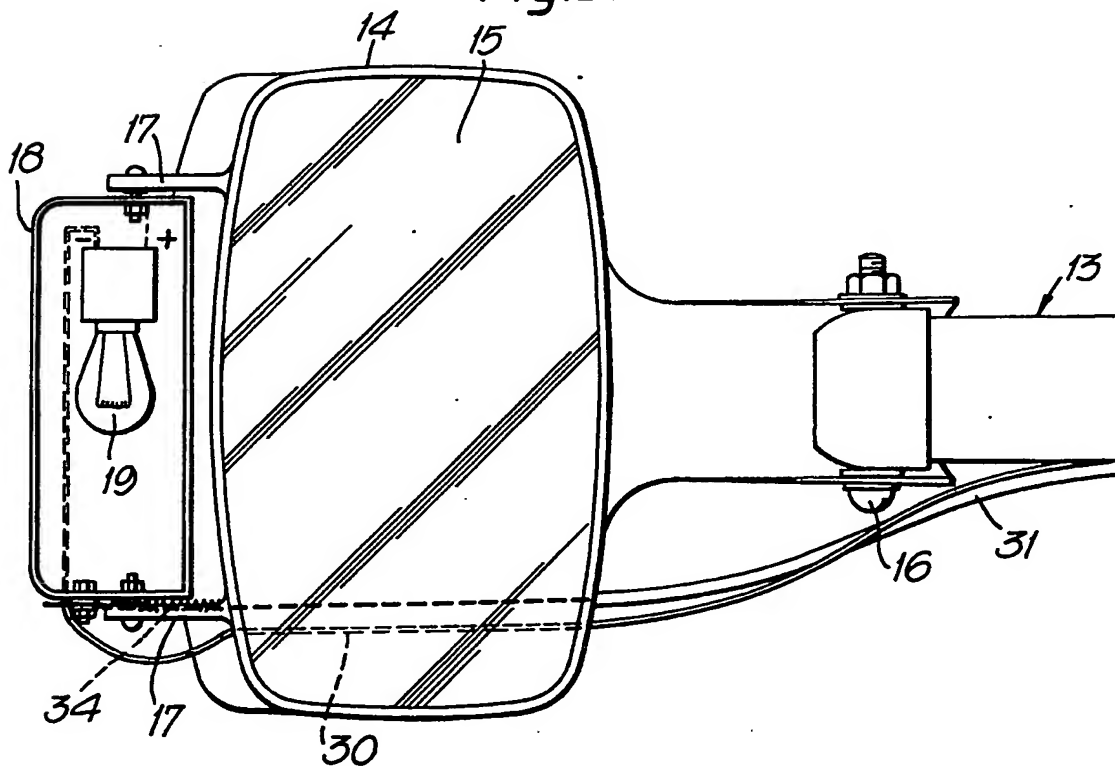


Fig.6.

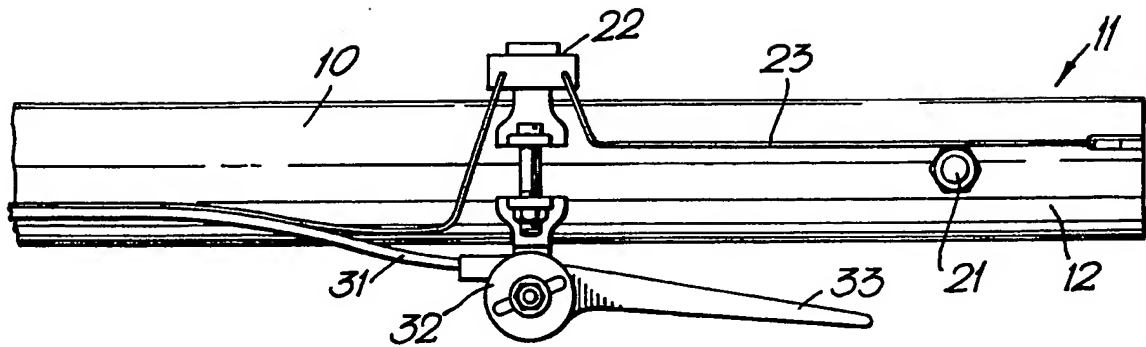


Fig.7.

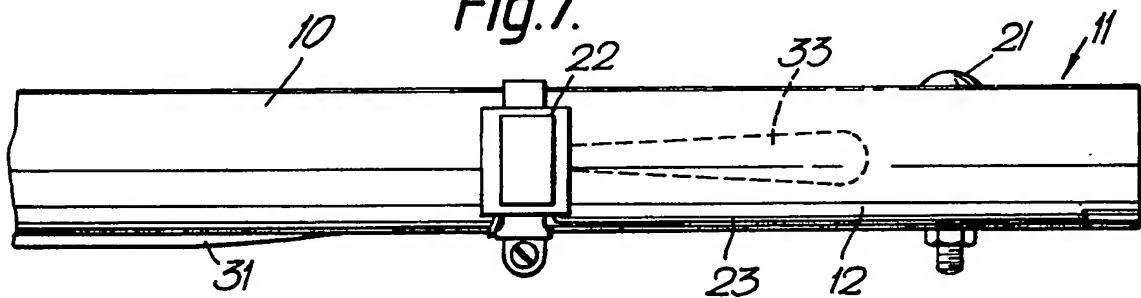


Fig.8.

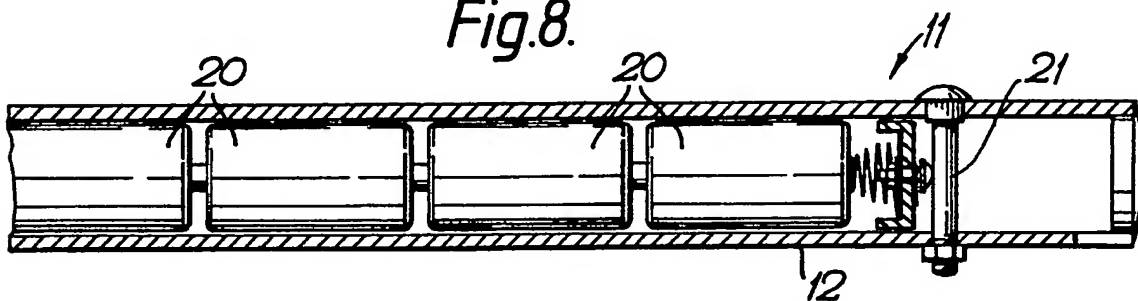
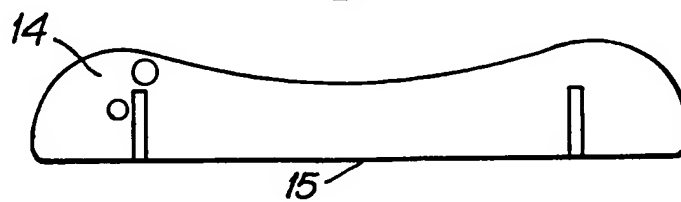


Fig.9.



INSPECTION DEVICE

The present invention relates to devices for the inspection of inaccessible areas such as the engine compartments and under surfaces of motor vehicles.

5       Devices conventionally used for such inspections consist of mirror and light devices rigidly attached to rods. Considerable manoeuvring of these generally inefficient devices is frequently necessary, and often requires the adoption of uncomfortable positions by operators of the devices.

10       According to the present invention an inspection device includes a rod having at a first end a grip and at a second end a mirror and a lamp with an associated beam focusing assembly, the direction of a beam of light produced by the lamp being adjustable by movement of the focusing assembly under the control of actuating means situated at the first end of the rod.

15       The focusing assembly is preferably so constructed that in use the lamp is shielded from an operator of the device.

20       The actuating means might be a pivoted control lever connected to the focusing assembly by means of a Bowden cable arrangement. The combined mirror and lamp focusing assembly might conveniently be pivotably mounted at the end of the rod to allow them to be folded back along the rod for easy stowage.

The mirror is preferably of convex shape to give a wide field of view.

25       The lamp might be powered by means of batteries contained within the rod, or from an external source of electricity. Control of the lamp is preferably achieved by means of a switch, which is preferably positioned adjacent to the focusing assembly actuating means.

One embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, of which:

30       Fig 1 is an elevation of a device according to the invention,  
Fig 2 is a plan view corresponding to the elevation of Fig 1,  
Fig 3 is an elevation in section along III-III of Fig 2,  
Fig 4 is an elevation giving an enlarged view of part of the device,  
35       Fig 5 is a plan corresponding to Fig 4,  
Fig 6 is an enlarged view of another part of the device,  
Fig 7 is a plan view corresponding to Fig 6

Fig 8 is a plan view in section along line VIII-VIII of Fig 7,  
and

Fig 9 is a detail of another part of the device.

An inspection device (Figs 1 and 2) consists of a rod 10 having at  
5 a first end 11 a grip 12. At the other end 13 of the rod 10 is a mirror  
assembly 14 holding a convex mirror 15 pivotably mounted on a pivot 16.  
Extending from the mirror assembly 14 are two brackets 17 between which  
are rotatably mounted a beam focusing assembly 18 holding a lamp 19,  
the focusing assembly 18 being so constructed that, in use, the lamp  
10 19 is shielded from a user of the device.

A plurality of batteries 20 (Figs 3, 8) are positioned within the  
rod 10 between the pivot 16 and a battery securing bolt 21, and these  
are connected by suitable wiring (Figs 1, 3, 4 and 6) 23 through a  
switch 22, which is preferably of the pivoted-pad type operated by a  
15 sideways movement, to the lamp 19.

The focusing assembly 18 has attached thereto one end of a Bowden  
cable 30 (Figs 1, 4) which passes through a sheath 31 one end of which  
is secured to the mirror housing 14 and the other to structure 32 (Fig  
6) on which is pivotably mounted a control lever 33 to which is attached  
20 to the other end of the Bowden cable 30. The focusing assembly 18 is  
biased towards a predetermined position by means of a spring 34.

The pivot 16, mirror housing 14, brackets 17 and focusing assembly  
18 are preferably constructed of conducting material so that the elec-  
trical connection 23 might consist of a single (usually negative) wire.

25 When not in use the device will usually be stored with the mirror  
housing and focusing assembly 18 folded back against the rod 10 as shown  
in dotted lines at 114 in Fig 1. The device is prepared for use by  
rotating the mirror housing 14 around the pivot 16 to the operational  
position shown in full lines in Fig 1.

30 In use the device will be so positioned by an operator that a good  
field of view of a required area can be seen through the convex mirror  
15. The lamp 19 may then be switched on by use of the switch 22 and  
the focusing device 18 manoeuvred by use of the control lever 33 until  
the beam of light produced by the lamp 19 directly illuminates a  
35 position of interest.

Positioning of the mirror holder 14 and mirror 15 may be facili-  
tated by suitable shaping of the mirror casing 14 as illustrated in  
Fig 9.

It will be realised that many alternative versions of the device, within the scope of the invention, are practical. For example provision may be made for connection of the lamp 19 to a vehicle or mains supply. Alternatively a mains supply connection may be made available  
5 for recharging, preferably in situ, batteries 20 of a rechargeable type. Alternative forms of lamp, such as strip lights, might be alternatives to the lamp 19. Any suitable number of batteries 20 might be positioned within the rod 10 to provide suitable voltage for the lamp 19.

It will also be realised that whilst the above described embodiment  
10 of the invention involves adjustment of a focusing assembly 18 rotatably mounted on a mirror housing 14 the assembly 18 and housing 14 might be rigidly secured together and the combination adjusted by means 30, 31, 32, 33, 34. Devices wherein mirror housing 14 and focusing assembly 18 are individually adjustable will also be readily apparent to those  
15 skilled in the art, but the complication of individually adjusting these will usually outweigh the advantages to be gained by such arrangements.

Also, as an alternative to the above suggested means for supplying power to the lamp, one or more batteries might be situated more adjacent the lamp, being installed immediately prior to use of the device.

CLAIMS

What is claimed is:

1. An inspection device including a rod having at a first end a grip and at a second end a mirror and a lamp with an associated beam focusing assembly, the direction of a beam of light produced by the lamp being adjustable by movement of the focusing assembly under the control of actuating means situated at the first end of the rod.
2. An inspection device as claimed in Claim 1 wherein the focusing assembly is so constructed that, in use, the lamp is shielded from an operator of the device.
3. An inspection device as claimed in Claim 1 or in Claim 2 wherein the actuating means includes a pivoted lever connected to the focusing assembly by means of a Bowden cable arrangement.
4. An inspection device as claimed in any one of Claims 1 to 3 wherein the mirror is of convex shape.
5. An inspection device as claimed in any one of Claims 1 to 4 wherein the lamp is powered by means of batteries contained within the rod.
6. An inspection device as claimed in Claim 5 wherein the batteries are of the rechargeable type and including means whereby the batteries can be recharged in situ.
7. An inspection device as claimed in any one of Claims 1 to 4 wherein the lamp is powered by means of an external source of electricity.
8. An inspection device as claimed in any one of Claims 1 to 7 wherein control of the lamp is achieved by a switch.
9. An inspection device as claimed in Claim 8 wherein the switch is adjacent the focusing assembly actuation means.
10. An inspection device as claimed in Claim 8 or in Claim 9 wherein various items are constructed of conducting material such that only a single wire connecting the switch to the lamp is required.
11. An inspection device as claimed in any one of Claims 1 to 10 wherein the combined mirror and lamp focusing assembly are pivotably mounted at the end of the rod to allow them to be folded back along the rod for easy stowage.
12. An inspection device as claimed in Claim 11 wherein the mirror and the lamp focusing assembly are rigidly attached together such that they move together under the control of the actuating means.



13. An inspection device substantially as herein described with reference to Figures 1 to 9 of the accompanying drawings.